

Notice of Allowability

Application No.

10/624,921

Examiner

Rodney G. McDonald

Applicant(s)

BERNICK, MARK A.

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 1-16-07.
2. ☒ The allowed claim(s) is/are 1-3,5-7,9,11-15,17,18 and 20-23.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 1-29-07.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.


RODNEY G. MCDONALD
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 16, 2007 has been entered.

Priority

Applicant's claim for the benefit of a provisional application 60/397,629 under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

Examiner's amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Paul Reznick on January 29, 2007.

The application has been amended as follows:

Claim 9, line 3, delete the word "profiled".

The following is an examiner's statement of reasons for allowance:

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Claims 1-3, 5-7, 9, 11, 12, 20 and 21 are allowable over the prior art of record because the prior art of record does not teach a magnetron sputtering electrode for use with a magnetron sputtering device, the magnetron sputtering electrode including a closed magnet arrangement received within a magnet receiving chamber and coupled to a rotary drive unit, the closed magnet arrangement comprising of a plurality of magnets adapted for motion relative to a target by the drive unit, wherein at least one of the plurality of magnets is a profiled magnet, the profiled magnet having a contoured top portion and defining an apex is positioned adjacent to the outer edge of the target wherein the magnet arrangement has two or more rotational degrees of movement about an axis.

Claims 13, 14, 22 and 23 are allowable over the prior art of record because the prior art of record does not teach a magnetron sputtering electrode for use with a magnetron sputtering device, the magnetron sputtering electrode including a closed magnet arrangement comprised of an inner assembly and an outer assembly, the inner assembly and the outer assembly comprised of a plurality of profiled magnet segments, wherein each of the profiled magnet segments includes a contoured top portion having an apex, wherein the closed magnet arrangement is situated beneath a target and is coupled to a drive shaft, wherein at least one of the profiled magnet segments has an apex positioned adjacent to the outer edge of the target, and wherein the drive shaft is adapted to rotate the closed magnet arrangement in relation to the target and the magnet arrangement whereby the rotation motion of the drive shaft further comprises two or more rotational degrees of freedom of movement about the axis.

Claims 15, 17, 18 are allowable over the prior art of record because the prior art of record does not teach a method of improving target utilization in sputtering applications, the method including providing a closed magnet arrangement within a magnet receiving chamber, the closed magnet arrangement comprised of a plurality of magnets, wherein at least one of the plurality of magnets is a profiled magnet having a contoured top portion, the contoured top portion includes an apex that is flat, wherein the apex is up to half the thickness of the magnet segment and wherein the apex is positioned adjacent to the outer edge of the target; moving the closed magnet arrangement in relation to the target, wherein the motion further comprises two or more rotational degrees of freedom of movement about an axis, wherein the two degrees of freedom of movement are selected from concentric motion and eccentric motion and deposition the target material on the substrate.


The closest prior art of record to Kobayashi et al. (U.S. Pat. 5,944,968) teach a rotational magnet that moves rotationally and eccentrically but fails to teach magnets with a profiled shape having an apex with the apex positioned adjacent to the outer edge of the target. Shinohara, Masaki et al. (Japan 61-235560) and Fukami et al. (Japan 61-14194) teach profiled magnets but without rotating the profiled magnets. There is no motivation or suggestion to rotate these profiled magnets from the prior art. Furthermore, there is no appreciation in the prior art that rotation of profiled magnets as required by applicant's claims will improve target utilization as highlighted in Applicant's declaration which states that unexpected results are achieved by rotating profiled magnets.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
January 29, 2007